THE FINAL EVALUATION OF THE CURRICULUMNET PROJECT OF THE NATIONAL CURRICULUM DEVELOPMENT CENTRE – UGANDA/IDRC

FINAL REPORT

BY

DANIEL J BABIKWA (PHD.)

Makerere University,

Department of Adult Education and communication Studies

JOHN SSENTONGO (PHD.)

Makerere University

Department of Science and Technical Education

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ABSTRACT

This is an evaluation of the CurriculumNet Project of the National Curriculum Development Centre (NCDC). This project was initiated by NCDC and funded by IDRC. It started in 2001 in four secondary and three primary schools in urban, peri-urban and rural parts of the country. The project was done within the framework of the ongoing curriculum review and approval process. It was an Action research project to test the technical, operational feasibility and economic viability of ICTs in curriculum delivery in Uganda. The project was to examine the value added by ICTs to subject areas of the educational system and the extent to which teaching and learning was enhanced.

This evaluation set out to assess the achievement of the anticipated project outputs. It particularly sought to establish what changes the project had caused in the learning and teaching processes at the primary and secondary levels; the technical and operational feasibility of the project, the value added by ICTs and draw key lessons and make recommendations for future implementation of similar projects. A combination of qualitative and quantitative methods of data collection was adopted and a team of six researchers collected the data.

The evaluation demonstrated that the project achieved a number of positive outcomes despite the numerous challenges it encountered. The achievements included among other things an ICT-based curriculum in selected subjects, a refurbished resource centre electronically connected to some of the pilot schools and a core team of 66 locally and internationally trained ICT cadres including two project staff, four curriculum specialists and sixty teachers. There were obvious positive changes in the way teachers taught and the students learned. Teachers diversified their sources of teaching materials, and sought resources beyond the traditional text books; they contributed to the improvement of the quality of learning materials through action research, gained and utilised new ICT skills for educational and non-educational purposes.

Use of ICTs in educational delivery has motivated and positively changed students' attitudes towards mathematics and geography, and led to improvement in academic

performance. The quality of the ICT-based materials and the process of their development were also commended as good, clear, interactive and encouraging professional development.

Different types of local and international networks emerged as a result of the project and the different partners have mutually benefited. At policy level, the project is one of the different projects currently informing the ongoing policy formulation process on ICTs in education in the country.

As an Action Research project, CurriclumNet has among other things promoted practitioner research for professional development and some level of institutional learning has taken place at NCDC. The project effectively incorporated the three key components of Action Research – investigation, learning/education and action to create change.

Action research as a component of project implementation is part of value added to the teaching and learning process of pilot subjects. It constituted a pedagogical revolution as an empowering tool that has professionally transformed Ugandan teachers from consumers to creators of knowledge. Involvement of teachers in the development of ICT-based quality teaching materials, equity in curriculum delivery through ICTs, incorporating learners' feedback into the learning materials and responding to the three learning domains among other things, constitute the value added by ICTs to curriculum delivery in the selected schools.

CurriculumNet has demonstrated that with an ICT policy backed by equitable funding to all schools in the country to access the essential requirements of ICT-based curriculum delivery, the integration of ICTs in curriculum delivery can assist in bridging the gap between rural and urban schools, coping with large numbers of students, and stabilising costs on educational materials. The evaluation revealed that with sufficient funding, policy support, equitable distribution of essential facilities across the country and

technical empowerment, it is not only operationally possible but also technically and economically feasible to use ICTs in curriculum delivery across the country.

The above achievements notwithstanding, a number of challenges were also identified. Teachers were for example slow in adjusting both mentally and practically to the use of ICTs in educational delivery. Schools not only had different capacities to integrate ICTs in their programmes, but also suffered from general infrastructural problems like erratic electricity supply; lack of access to internet, inadequate knowledge and skills for simple maintenance of ICTs, inadequate staffing at the centre and unexpected delays in the delivery of essential project equipment and software among other things.

1.0 Background to the evaluation

This was an end term evaluation of the CurriculumNet project funded by the IDRC and implemented by the National Curriculum Development Centre (NCDC) – Uganda. The NCDC initiated the project to pilot an innovative mechanism for curriculum development and delivery using modern information and communication technologies (ICT). By proposing this project the NCDC sought to devise and pilot an ICT-based curriculum integration and delivery strategy for primary and secondary school levels in the country. The project was to enable educators, educational administrators and students to develop appropriate competencies to effectively use ICTs in the teaching and learning process and it was done within the framework of the ongoing curriculum review and approval process.

This was also an action research project testing the technical and operational feasibility; economic viability of ICTs in educational delivery; the value added by ICTs in core subject areas of the educational system and the extent to which the project enhanced teaching and learning.

The project specific objectives included among others:

- To train a cadre of trainers from participating schools and curriculum specialists in basic computer skills and ICT curriculum design in order to train others;
- To develop computer-based curriculum instructional materials in selected core subjects;
- To monitor, evaluate and document the performance of the project and the understanding about the use of ICT in education;
- To use the practical experiences and expertise gained through the project to formulate policy recommendations in respect of technology enhanced education in Uganda.

1.1 The underlying assumptions of the project were that:

- The use of ICTs in the learning and teaching process would greatly improve the capacity of the education system to cope with large numbers of students especially expected at primary level, and to improve quality, equity and access to education;

- Once teachers are equipped with computer and curriculum integration skills, they would be able to enhance instructional materials, access an inexhaustible source of references and materials from the internet and other electronic repositories, and to collaborate with other teachers around the world;

- Students would develop personal knowledge and skills of problem-solving, information gathering, and to collaborate and share information easier and faster;

- Students would in addition be equipped with productive and marketable skills necessary in the competitive information age;

- The disparities between rural and urban schools and the regional imbalance in the delivery of education in Uganda would be addressed;

- An overall reduction in educational costs due to timely and efficient delivery methods to the ever increasing school enrolment;

- An improvement in the learning environment through enhanced participation and quality of teacher-learner relationship which would boost learner achievement and confidence;

- The project would involve the whole school community; and

- Collaboration between teachers and students within and outside the school in learning through computer facilities would develop and grow.

1.2 Expected Results/Outputs

The project was expected to generate the following outputs:

- A fully equipped state of the art Resource Centre at the NCDC connected to 3 primary and 3 secondary schools to assist schools, administrators and curriculum developers in implementing ICT-based education systems.

- A cadre of skilled teachers and students in participating schools, tutors at the Institute for Teacher Education-Kyambogo (ITEK), curriculum developers and researchers at NCDC, UNEB and the Inspectorate of Education trained in technology integration in the teaching and learning process (i.e design and use of functional ICT-based curriculum).

- Curriculum content materials, in electronic and print forms, on core curricular subjects of the present syllabus.

- A fully operational curriculum network that will be delivering ICT-based teaching and learning materials.

- Improvement in basic computer literacy and curriculum development skills under the World Links Program and approved by the Ministry of Education in September 2000.

- Databases and a web-site containing valuable curriculum content for participating schools and institutions.

- A research, monitoring and evaluation system for assessing outcomes of ICT integration in the education system in Uganda Schools contributing to IDRC's ELSA activities within the School networking context and to the body of knowledge in school networking.

- Electronic networks among on-going school networking initiatives in Uganda and use with the private sector for information sharing and exchange.

- A body of knowledge on the factors that promote or impede the development and use of ICTs in Uganda's educational system.

- Specific policy recommendations that could guide the process of technology integration into the teaching and learning process in Uganda.

1.3 Needs assessment

Prior to the implementation of the pilot project, a needs assessment was conducted by a team of consultants to identify the schools to participate in the project, assess the existing infrastructural facilities in the participating schools; discuss with subject heads principle teachers and students to identify the topics to be piloted; prioritise the identified needs and subjects; and to identify types, information sources and constraints encountered in getting information.

Criteria for the selection of schools subjects and topics

The selection of schools was based on among other things:

- Internet connectivity;
- Availability of minimum telecommunications and electrical power infrastructure;
- Gender balance to give boys and girls equal opportunity;
- Regional balance
- The geographical location of the schools i.e. whether urban or rural;
- Administrative support for the project,
- Schools that provided a wide opportunity for participation of students ad teachers; and

- The student/pupil to computer ratio

The evaluation reviewed the criteria and found it most appropriate, although as later discussed, some of the assumptions about connectivity and power availability conflicted with the reality on the ground.

The selection of subjects was done in a more participatory manner. The views were generated from pupils in the selected classes and their teachers. The subjects were ranked according to respondents' views on how easy or difficult particular subjects were

1.4 Critical areas of concern identified

On examining the key assumptions of the project, the objectives, and expected outputs, we realised that although the project was meant to introduce a mechanism for curriculum development and delivery through ICT, it would ultimately revolutionalise the teaching and learning process in the pilot schools both directly and indirectly. It would not only deconstruct teachers' and learners' mindsets on teaching and learning and initiate a self-propelled process of professional development through Action Research, but also expose them to rare skills in computer use, and opportunities for interacting with people of like minds locally and internationally. With all this in mind, we wondered how much of this had been achieved within the anticipated time frame; what kind of changes had the project created in the areas of curriculum development and delivery. We also wished to establish the extent to which the knowledge and skills have been translated into action on the ground including the effects both on the students and teachers. At another level, we sought to investigate the challenges encountered in the implementation and how the project coped with such challenges. In the final analysis, we thought it essential to establish lessons from the process that could inform similar ventures and policy decisions in future.

1.4 Evaluation Questions

To address the above concerns, the current evaluation sought to generate answers to the following questions:

- To what extent has the project led to an improvement in the teaching and learning of the piloted subjects; (What changes have occurred in the way teachers teach, prepare, and examine?) and what changes have occurred in the way students learn?
- Which materials were produced as part of the project, how were they produced and of what quality are they? How were they used and by whom?
- What changes have occurred in the performance (examinations) of students in the piloted subjects and to what extent can the change be attributed to the project?
- What kind of partnerships and networks have evolved as a result of this project and of what value are they?
- What influence has the project had on national educational policy with regard to ICTs? *(budget commitment by government and other donors to the project)*
- How has the Action research component been utilised as a tool for implementation and a catalyst for professional development and institutional learning?
- What challenges have been encountered during the implementation and how has the NCDC and other stakeholders responded and with what effects?
- What strategies have been put in place to ensure the sustainability of the achievements of the project and the fact that it creates a multiplier effect?
- What lessons can be derived for future implementation of similar programmes?

1.5 Objectives

1- To establish what changes the project has caused in the learning and teaching processes in the primary and secondary levels;
2- To assess the project implementation processes identifying key challenges and strengths of the project;
3- To establish the value added by the use of ICTs in curriculum delivery;
4- To draw key lessons and make recommendations for future implementation of similar projects

1.6 Scope of the evaluation

Because of the unique nature of each of the pilot schools in the project, the evaluation covered all seven pilot schools, the NCDC, the Inspectorate of Education, ConnectED at Kyambogo University and SchoolNet Uganda. The evaluation specifically focused on the process of implementation, the related institutional and other issues, and the project outcomes.

2.0 METHODOLOGY

2.1 Evaluation process and procedures

This was largely a qualitative study trying to establish key issues emerging from the implementation of the curriculumNet project. It sought to generate useful lessons from the project and key insights on the integration of ICTs in educational delivery from curriculum specialists, teachers, school administrators, policy makers, partners and students.

2.1.1 Data sources

The major sources of data included:

- Project documents (baseline report, project proposal, mid-term review report, monitoring reports and any other relevant documents
- Project staff at NCDC
- Curriculum specialists
- Representatives from the collaborating institutions (Inspectorate of education, Kyambogo University - connect Ed, schoolNet)
- Staff from participating schools (subject heads and teachers, school administrators, ICT managers and technicians)

2.1.2 Study population and sample size

The study covered six different populations. Eight (8) students were purposively selected from the pilot classes in each of the participating schools. The sample included students who had participated in the project and those still in the project classes, all amounting to fifty six (56) students.

Fourteen (14) teachers and administrators were included in the sample. While we had intended to separate teachers' and administrators' experiences in the field compelled us to abandon that strategy on realising that there was no major difference in the responses being generated from the different categories of respondents. This was also due to the fact that in all schools we were not able to meet the head teachers. In most cases we interviewed Directors of studies and heads of departments.

We interviewed two core project staff, two curriculum specialists, four teachers in charge of the computer laboratories, a representative from the connect Ed project at Kyambogo University, a representative of the Schoolnet project and one Assistant commissioner of education in charge of ICTs in the Ministry of Education.

2.1.3 Methods and tools

In all seven research instruments were used to generate data from the different respondents. The instruments included separate interview guides for:

- school children who participated in the project,
- teachers and school administrators
- core project staff
- curriculum specialists
- ICT/Laboratory administrators
- Representatives of collaborating institutions (ConnectEd, Schoolnet, Ministry of Education – Inspectorate)

2.1.4 Actual data collection

Data collection was done by a team of six research assistants supervised by the lead consultant and the co-investigator. Prior to the actual data collection the team pre-tested the evaluation tools at one of the pilot secondary schools and a few adjustments were made on the instruments.

a) In-depth interview guides were used to generate data from the project staff, teachers and other key stakeholders
b) A focus group discussion guide was used to generate data from students. This tool was preferred because of its potential to generate a cross section of on-spot verifiable qualitative data from such a homogenous group of respondents.

3.0 EVALUATION FINDINGS

In this section the findings of the evaluation are presented and discussed based on the key evaluation questions and expected project outputs.

3.1 Refurbishing the Resource Centre at the NCDC

In order to kick-start the CurriculumNet project, the Resource Centre at the National Curriculum Development Centre had to be transformed into a fully equipped State of the Art Resource Centre connected to 3 primary and 4 secondary schools to assist educators and curriculum developers in implementing ICT-based education systems.

The resource centre was in a sorry state prior to the curriculumNet project with old ICT equipment, most of which were obsolete and not functioning. New ICT equipment were purchased and installed to replace old ones as part of the preparation for the implementation on the CurriculumNet project. The refurbished centre played a central role in making the project realise its anticipated goals.

The revitalisation of the resource centre also constituted an ICT revolution at NCDC. The centre was used to train NCDC members of staff to use computers for both professional development and daily personal use. This training according to project staff helped to positively change staff's attitude towards the use of ICTs in general and computers in particular. According to one of the core staff on the project, the technology phobia among staff was replaced with enthusiasm and scramble to apply the new knowledge and skills as expressed by one of the project staff.

> "… after learning basic applications, they began typing their work and making presentations using PowerPoint … the lab/resource centre became too small, with each person eager to use the computers. As a result, many demanded to have computers on their desks"

The project utilised the centre in several ways some which were not anticipated. In addition to the training of NCDC staff, teachers under the project together with different subject panellists were trained at the centre. The development, dissemination and revision of both online and offline educational materials in the piloted subjects would not have been possible without the centre.

The centre has in addition to its anticipated roles taken on two major ones not envisaged at its inception.

1. It currently effectively serves as a tele-centre and an internet café for the NCDC community.
2. It has also become a computer refurbishing centre for schools and by the time of the evaluation over four hundred computers had been refurbished so far.

The two are very important unintended outcomes of the project. On the one hand, the refurbishing function provides a solution to one of the biggest challenges to the integration of ICTs in educational delivery i.e. maintenance of computers as later discussed. On the other hand, using the centre as a tele-centre has strengthened the capacity of NCDC staff to network with people in different parts of the world both at the professional and personal levels.

The state of the resource centre before and after the refurbishment is summarised in the table below

Table 1 the state of the resource centre before and after refurbishment

Pre-project state of the resource centre	**Current state of the resource centre**
- 5 working refurbished 486 donated by WorldLink - 1 HP printer 1100 series - 1 non functioning scanner, - 1 non functioning HP printer - non functioning dial-up internet connection, - no connectivity	- 5 brand new Compaq Pentium 4 computers - 4 Pentium 3 refurbished computers fully multimedia; - Heavy duty printer hp 4100; - LCD projector ACER - HP CD writer 8500 series; - Digital camera - Zip Drive
	- software- office 2000, - windows 2000 server - 3D Studio multimedia (Max, EON studio)
	- micro-wave dish upgraded from 30 KBPS to 64 KBPS - 1 Router - 2 hub

The above notwithstanding, updating the resource centre encountered unexpected hiccups, leading to delays in the delivery of some of the key equipment and software. The MAX and Eon studio software for the multi-media studio for instance arrived two and a half years after the project had started which affected the implementation process.

In addition, one of the anticipated outcomes, the establishment of an electronic network connection between all seven schools was only partially achieved. It was only the well

resourced schools like Ntare School, Kings College Buddo, Nabisunsa girls SS and Buganda Road that could boast of an electronic connection. The rest of the schools did not have Internet connectivity which certainly excluded any chance of using web-based materials. That's why the project adopted the use of CDs in all schools not only to offset this challenge but also to act as a back up in the face of the erratic Internet service.

3.2 The creation of ICT cadres through training

One of the major goals of the project was to create a body of ICT cadres with knowledge and skills in integrating ICTs in curriculum delivery. This was to be achieved through a series of training activities organised under the project framework at the NCDC. The project trained different categories of people, including:

- two (2) core project staff,
- four (4) curriculum specialists and
- Sixty (60) teachers and school administrators.

The training focus varied according to project needs, anticipated role of the particular category of people and their level of computer literacy. The core project staff were trained locally and overseas in multimedia development and the integration of ICTs in curriculum delivery, and outcomes mapping for monitoring and evaluation of project progress. The multimedia development course was a two months' training at Memorial University, New Found Land in Canada while the others were organised at NCDC.

The training for curriculum specialists centred on two major areas namely:

- Content development for online curricula (in digital form)
- Basic use of computers including the Internet for professional development and personal use.

The teachers' training was arranged in three phases, of three weeks, two weeks and one week respectively. The initial three weeks' training introduced them to basic skills in computer use, some for the first time. They also learnt how to access information and use it to develop appropriate instructional materials in digitalized form.

In the two weeks' training that followed, teachers were given more hands-on skills in developing ICT based curricula and also perfected the materials developed in the first training.

The last one week training specifically focused on editing the teaching materials developed. The trainers adopted a practical hands-on action oriented training approach in which theory was integrated with practical work and always emerged out of the training with concrete results.

3.2.1 Teachers' assessment of the training they received

The teachers who participated in the training organized by the project expressed divergent views about the adequacy of the training they had received as shown in figure 1 below.

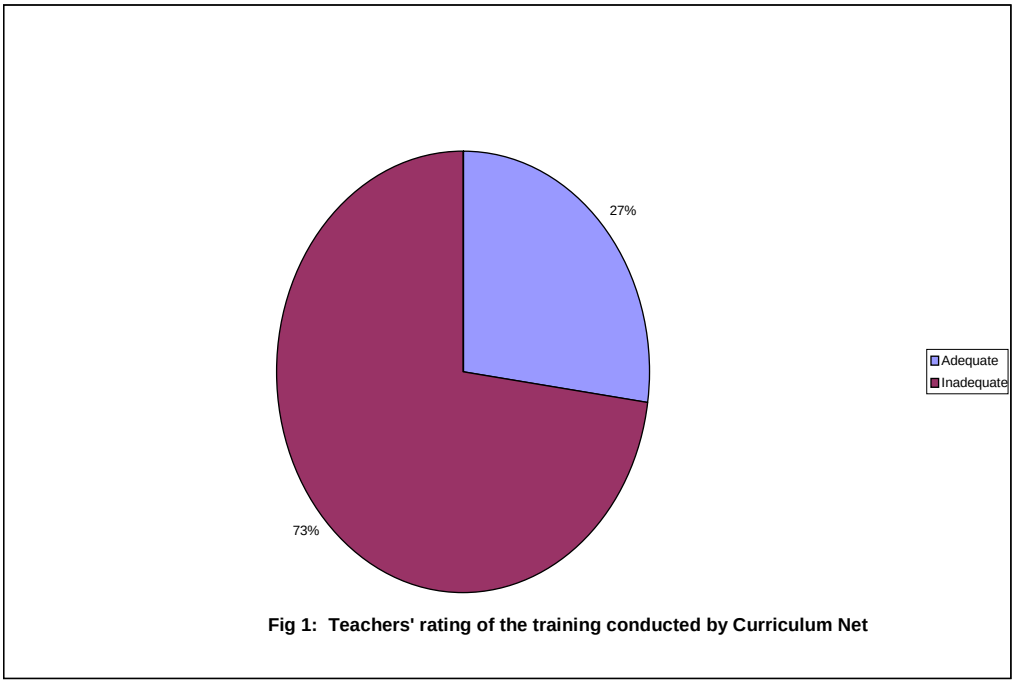

Fig 1: Teachers' rating of the training conducted by Curriculum Net

Figure 1, shows that the majority of the teachers (73%) who attended the training in the use of ITCs in curriculum delivery felt that the training was inadequate. They saw the

training period as too short which inevitably congested the training programme and led to a hurried rush through the learning materials. One of the trained teachers observed "…the training was not adequate because the training period was short and most of the materials were hurried through all the time. I cannot remember some of the programmes like PowerPoint for example"

Secondly, not all the sixty teachers who went through the programme attended all the three trainings. Some of the teachers attended only the first training which may partly explain why some teachers indicated that the training was too short. The few teachers who attended all the training programmes reported that after the first training, subsequent trainings were more relaxed; less congested and filled the gaps that had been created by the initial training.

The general view of the teachers was that the training in online content development was largely adequate but they required more exposure to other ways of using and managing ICTs. They complained of lack of knowledge on basic troubleshooting and maintenance which often frustrated their activities.

3.2.2 Additional training and utilisation of the skills

In addition to the training by curriculumNet findings revealed that some teachers had received related training from other sources. For instance, World Link, a South African Company had trained 23 teachers at Ntare School. Besides, teachers in charge of the computer laboratories and those teaching or interested in ICT had had several training opportunities organized by organizations like World Bank, The Ministry of Education and Sports, Schoolnet and connect Ed.

The teachers who were trained by curriculumNet in the use of ICTs in education delivery shared their knowledge and skills with fellow teachers and students in their schools and sensitised them about the value of ICT in educational delivery and introduced them to basic computer skills

In addition, some of the trained teachers from Kisowera primary school for example trained/assisted fellow teachers in the neighbouring school on how to process examinations and reports using computers. In the same school, the teachers introduced neighbouring community to basic computer skills. This was possible because of the existing cordial relationship between the school and the community. Although it was not possible to establish the actual numbers of people who benefited in this manner, this was enough evidence that the training had some multiplier effect.

3.2.3 Curriculum specialists' assessment of the training

The evaluation team earmarked curriculum specialists at the NCDC as key informants in the evaluation. Two of the four curriculum specialists trained by the project were interviewed to get their independent assessment of the training programme in which they participated.

The two curriculum specialists felt that the training was not adequate especially for those who were being exposed to the use of computers for the first time. The curriculum specialists saw themselves as core to the project since they were mandated to guide the teachers in the development of online curriculum and other materials. Both of the specialists interviewed still felt that their capacity to develop ICT based curriculum content was inadequate which made it a little cumbersome for them to effectively guide the teachers.

3.3 Competence in the use of ICTs

Teachers' and students' competence in using ICTs in teaching and learning as a result of participating in the project was measured using different criteria including teachers and students' personal rating of one's level of computer literacy, their levels of confidence in using ICTs in teaching and learning and the frequency of using computers. It was felt that the frequency of use would give an insight as to how much teachers' and students' attitude towards the use of computers had improved.

3.3.1 Teachers' and students' literacy levels

A closed question on the computer literacy levels of students and teachers who participated in the project was asked. The respondents had to categorise themselves as illiterate, fairly literate or fully literate, and the results are presented in Figure 2, below.

The figure shows that the biggest percentage of students and teachers were fairly computer literate. The percentages of students and teachers who considered themselves fully computer literate were just below 20 while the percentages of those who considered themselves computer illiterates was below 10 for both the teachers and students.

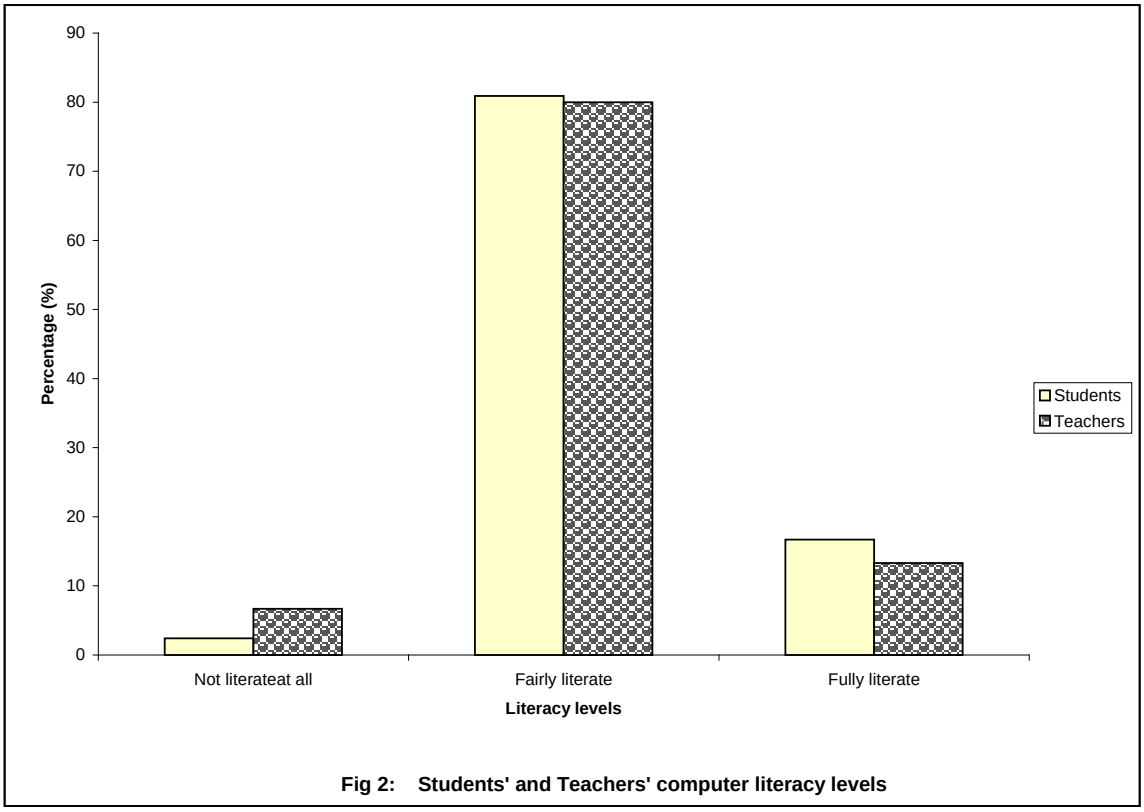

Fig 2: Students' and Teachers' computer literacy levels

Fairly literate students and teachers could operate a computer, search/access and process information while those who considered themselves fully literate could run several computer programmes, create and manage different files.

The teachers who indicated that they were fairly computer literate were those who had only been trained through the project in using ICTs in teaching and learning. This probably confirms the earlier view by both teachers and administrators that the training was not adequate.

Fully computer literate teachers are the ones in charge of the computer laboratories and/or teaching computer lessons in their respective schools. Teachers in this category had had several training opportunities in ICT though not necessarily how to use ICTs in education delivery.

The students and teachers who were computer illiterate did not get any training at all. The illiterate teachers said that they joined the project towards the end when those who had been trained by the project had been transferred.

On the one hand, those students who considered themselves computer illiterate stated that they joined the classes/streams which participated in the project after the ICT based materials had been used in the teaching. On the other hand, students who fully participated in the project considered themselves fairly computer literate. The major reason for perceiving themselves as such was the limited access to computers at school. Students had fewer hours in the computer laboratory and often only as part of the official class. Students in lower levels in both secondary and primary schools complained of being denied access to the computer laboratories outside the official learning time. This was worse and in some cases contradictory with classes which were not officially part of the CurriculumNet project. It was contradictory in the sense that students who were exposed to the use of ICTs in senior two would be barred from using the same computers in senior three, because senior three was not a target class in the project. This directly accelerated the rate at which the students relapsed into computer illiteracy.

Interestingly, all those students considering themselves fully computer literate were found to be having access to computers beyond the school, a number of them reporting that they had computers at home. This was also reflected in their response to the question

regarding how often they used computers. Such students often responded with another question “at school, at home or both?” This finding may represent an important relationship between access and competence and point at the need for increased access to computers if the anticipated benefits of ICTs in learning are to be realised.

3.3.2 Confidence in using computers in teaching and learning

The evaluation also looked at the participants’ confidence in using computers as this would confirm a positive transformation of learners’ mindsets with regard to the use of ICTs. Figure 3 below is a graphic representation of students’ and teachers’ levels of confidence in using computers.

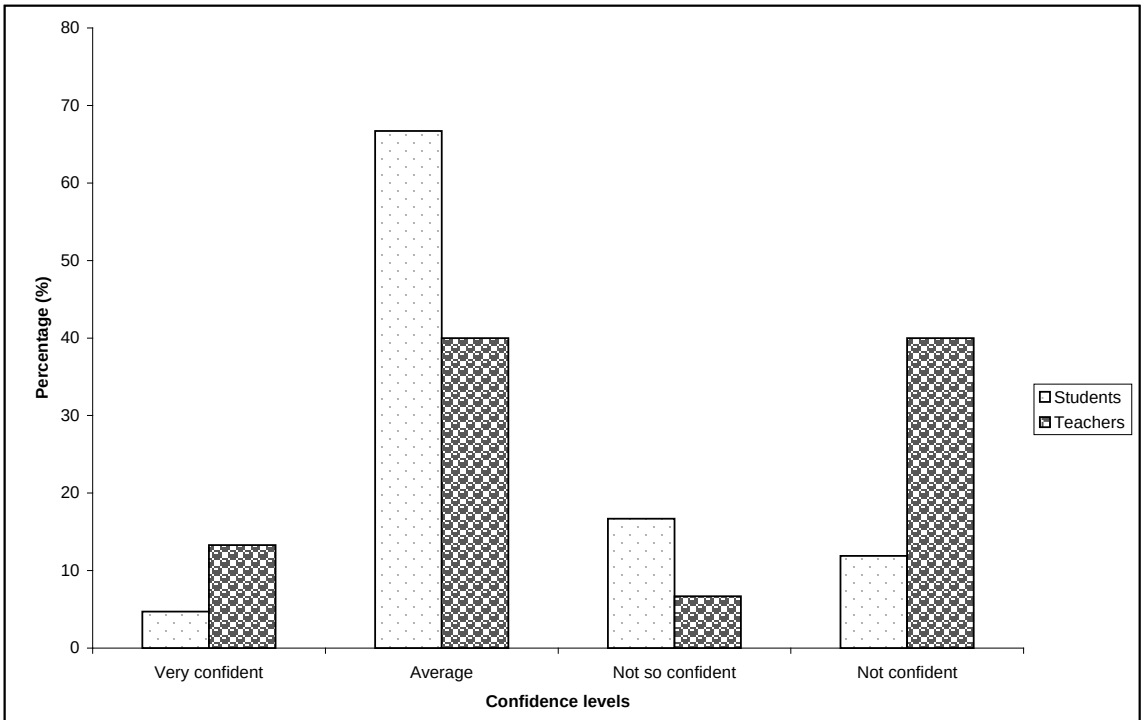

Fig. 3: Students' and Teachers' confidence in using a computer

Although a larger percentage of teachers (79%) who participated in the project perceived themselves as fairly computer literate, Figure 3 shows that a small percentage (39%) considered themselves averagely confident in using computers. This was probably due to

the limited exposure and utilisation of the available computer facilities as indicated in figure 4. An obviously higher number of teachers were either not so confident or not confident at all. There were several possible explanations for this including poor attitude to ICTs, limited access and apathy mentioned by one of the project staff (see section 3.6 a). As findings further illustrated, teachers who were not confident in using computers were often those who did not dedicate sufficient time to practice the acquired skills, even where access to the computers was not a problem.

Whereas the percentage of students perceiving themselves as very confident in using computers was low (10%), the percentage of those perceiving themselves as averagely confident was very high at (70%) compared to (39%) of teachers. In our interaction with the students we discovered that almost all students were excited and internally motivated by the mere fact that they had been introduced to the use of computers for academic and personal purposes. Unlike the teachers we met, students did not display any apathy, negativity or disinterest towards the use of computers in learning.

Among students, lack of confidence in using computers was attributed to limited access to computers in schools as the ratios indicate in Table 2. The ratio of students to a computer ranged between 5:1 to 20:1 and in some instances teachers used just one computer to teach the whole class/stream in some of the project schools.

Table 2: Ratio of students to computers

School	Computer	Students
Bukoyo SS	1	20
Nabisunsa	1	10
Ntare	1	9
Buganda Road	1	40
Buckley High	1	30
Kisowera	1	40
Buddo	1	8

3.3.3 Frequency of computer use by teachers and students at school

Figure 4 below shows that only 25% of the teachers use computers on a daily basis while the biggest percentage use computers either once or more than once a week.

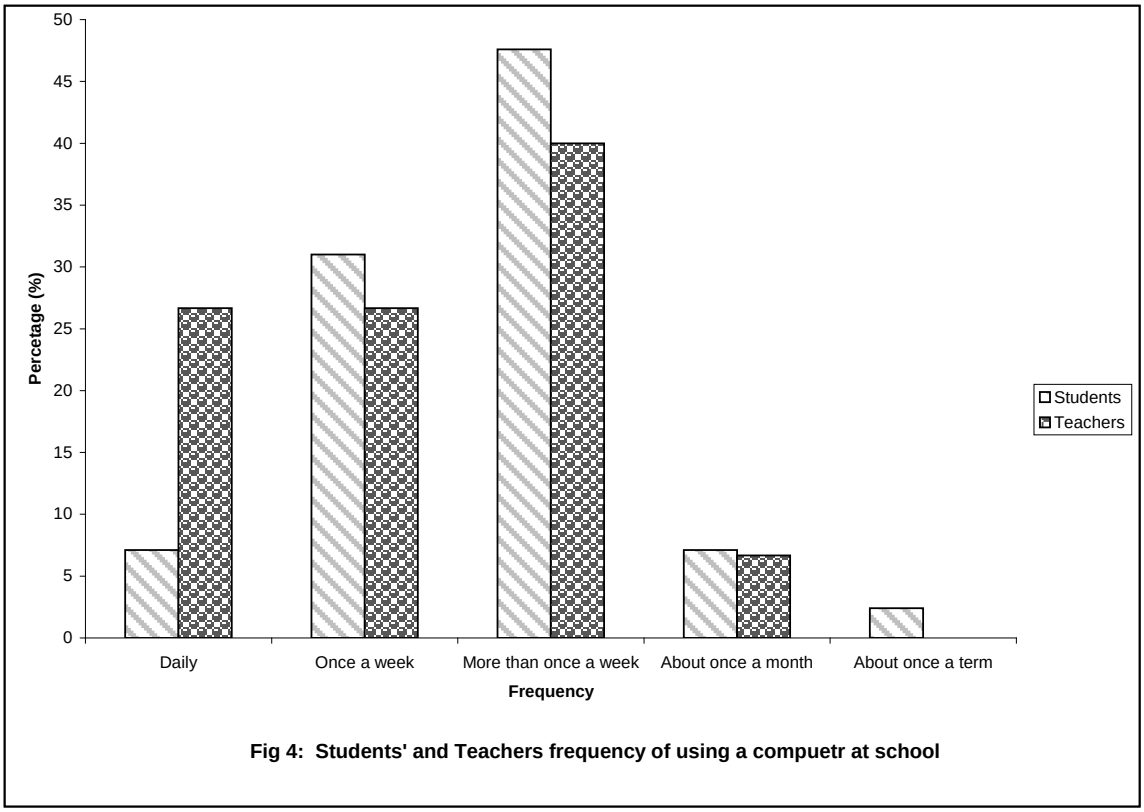

Fig 4: Students' and Teachers frequency of using a compuetr at school

The findings also revealed that between 30% and 50% of the students use computers more than once a week and once a week. In addition to the project activities, students interact with computers at school during computer lessons and during their free time on Saturday and Sunday. This explains why a big percentage of students used computers at least once a week. In cases where students had difficulties in accessing computers at school they used computers once a month or once in a school term. However, as mentioned earlier some schools intentionally restrict students especially 'O' levels from accessing computers on their own. Using computers for other activities than the academic (games and music) was raised as the main reason for restricting such students from using the computers.

3.3.4 How students and teachers in pilot schools use computers

Table 3 below shows how the students and teachers utilised the computer facilities at school.

Table 3: Ways in which teachers and students utilised computer facilities

Utilisation of computer	Students n = 56	Teachers n = 14
Access learning materials	28	
Teaching and peer teaching	16	09
Searching for information/internet	12	07
Entertainment – games and music	11	
Communication with friends	09	06
Preparing tests and examinations		07
Preparing class records		04
Prepare reports		05

The students interviewed indicated that they mainly used computers to search for information from the Internet and/or access learning materials prepared by their teachers. Searching for information is followed by personal use i.e. playing games and music. Few students used computers to communicate with other people on educational and non educational issues because many of the project schools either had no Internet or experienced problems with it.

The teachers used the computers mainly to prepare test/examinations and class records including reports. The acquisition of basic computer skills enabled teachers to prepare reports and examinations without relying on secretaries which they said had been a big inconvenience in the past

Apart from preparing class records and examinations, the teachers to lesser extent used computers to teach the topics covered by the material developed with CurriculumNet project. It was a lesser extent because the materials covered a very small content area

and a few classes/streams participated in the project activities. The teachers had few opportunities to teach the piloted subjects using computers. Most teachers in secondary schools teach one class/stream through 'O' level. This made it difficult for the teachers to use the ICT materials consecutively for the three years the project has been running. The fact that the materials only covered a few years and a few classes undermined the teachers' ability to monitor the change process in the students' learning styles beyond the pilot classes. Nevertheless, some innovative teachers used the ICTs available to teach topics outside the ones prescribed by the project. Teachers in three of the schools for example used PowerPoint presentations to teach (discussed later).

3.4 Instructional material development process

The materials were developed by a cross-section of personnel including: two NCDC project core staff, four curriculum specialists, panels of subject specialists and a team of specialists from Memorial University New Found Land in Canada. The materials were based on findings of a needs assessment/baseline survey by NCDC to determine which schools to participate in the project, the subjects to be piloted and the teachers to be trained. Below is an outline of the materials development process:

- Baseline survey to select schools, subjects and specific topics
- Training of teachers, subject panellists and curriculum specialists
- Training of the currculumNet core staff
- Content development and editing guided by curriculum specialists
- Continuous support supervision by OLIN curriculum specialists
- Alpha and Beta testing
- Trialing/piloting
- Revision

The reported training (see section 3.2, 3.2.1 and 3.2.2) of subject panellists and teachers of the piloted subjects was conducted after the baseline survey. This being an Action Research project to foster professional development among teachers, the development of instructional materials formed an integral part of the training programme. The NCDC curriculum specialists, core project staff and a team of online curriculum specialists from Memorial University, New Found Land in Canada guided the entire process.

In essence, teachers directly participated in the actual development of the online curricula materials from the initial drafting to the trialling stage and the subsequent improvements. The teachers' actual role in this included among other things: decision making on the topics to be piloted, the levels to begin with and the development of content. The ICTs specialists provided teachers with the technical support to transform the materials into online curricula. The materials developed were presented to the Academic Steering Board of NCDC for approval before delivering them to the project schools. Teachers in schools were once again provided with on-site training on how to use the materials. In addition to guiding the teachers on content development, curriculum specialists moderated the materials to suit particular levels, edited them and did on site guidance for teachers during project monitoring.

3.4.1 Types of materials, learners targeted and quality

The materials developed targeted specific classes both in primary and secondary. At the primary level, the subjects selected to be piloted included mathematics and social studies in primary four and five (4&5). At the secondary level, mathematics and geography were selected as the pilot subjects and, materials were developed for the senior one and two (1&2) in the two subjects. In all cases, the materials were produced on CDs, web-sites and in print format.

The fact that this was an Action Research project meant that the materials underwent a continuous process of review and critique by the teachers as the direct implementers, curriculum specialists, at times the students as the main beneficiaries of the project and other stakeholders to address the gaps identified during implementation. By the time of the evaluation, the materials had already been reviewed three times. Key actors in the development of materials including the teachers, NCDC project core staff and students testified that the third version of the materials was of a much better quality than the earlier ones.

Overall, the different respondents often described the materials as clear, interactive suitable to the learners' levels and user friendly. Materials were also described as learner-centred, motivating, interesting, with the ability to create a positive attitude among students towards the learning of subjects and topics hitherto not favoured. One of the respondents commenting on the quality of materials observed… "these materials are fully interactive with animation e.g. when talking about a volcano you see it erupting … such animations attract the students attention. .."

Comments showed that respondents liked the materials development process. They had also seen the value of the action research model followed in the development and implementation. The action research model turned the implementation process into a learning opportunity for the different actors to identify gaps and challenges, and use the emergent lessons to improve and strengthen the materials/programme. The comments made by all those who participated in the materials development process could be summarised in a statement by one of the teachers "it was a good process, nurturing ongoing professional development, after the process I believe I am a more accomplished educator"

3.4.2 Some concerns about the study materials

The above notwithstanding, different respondents raised a few concerns regarding the quality and usability of the materials. Some teachers were for instance concerned that online geography materials could not be used /accessed in schools without Internet. The fact that the home page of the online materials did not have an index also made it difficult for students and some teachers to open particular sections of the materials from the home page.

All respondents agreed that there were still some mistakes in the materials but according to them it was expected and understandable since the materials were still being piloted and under continuous revision. Some of the reported problems could however not be regarded as a reflection of the quality for the materials but rather either due to defective technology or gaps in the teachers capacity to use the technology. In Bukoyo and

Buckley it was reported for example that offline materials on CDs were visual but not audible, only to establish that many of the computers being used were obsolete, lacking the very basic sound system. The teachers could not independently tell what the problem really was.

3.5 The teaching and Learning Process

The way teachers used ICTs during the teaching and learning process varied from school to school. In schools where computers were networked, the teachers used one of the computers in the laboratory as a server for students to access the material from the other computers. This arrangement enabled students to use the computers themselves although the ratios of students to a computer were very big, sometimes more than 20 students to a computer (see Table 2).

The big ratio was either due to lack of enough computers in a school, or failure by the school to network all the available computers. In one of the schools where computers had not been networked the teacher carried one computer to a classroom and used it to teach the whole class. Here, students' interaction with the computer was very minimal although some students indicated that they were availed with the materials, in particular CDs to revise during their free time on Saturday and Sunday.

3.5.1 Effects on teachers' styles of teaching

The use of ICT based materials changed the teachers' ways of teaching in that, teachers made more preparation than before and their lesson became more practical. The content was organized in such a way that students' learnt from known to unknown. Also, teaching became less cumbersome as students could teach themselves and consolidate what they had learnt in classroom. Respondents observed that ICT based instructional materials attract students' attention, simplify the subject matter and hence save time, in addition to making learners less dependent on the teachers.

According to core project staff, some of the teachers experienced a complete transformation in their pedagogical practices. There were two such cases in Ntare School and Kings College Buddo. In both cases none of the teachers involved had any prior experiences in using ICTs as a pedagogical tool; one had even never used a computer for anything. Interestingly, by the time of the evaluation, one of the teachers had even gone ahead to pursue postgraduate studies in ICT-based learning in Germany, the other had started making his own ICT based teaching materials and using PowerPoint presentation in all his teaching.

3.5.2 Changes in students' learning styles

With the computer knowledge and skills students acquired, their learning styles changed in the following ways:

- They became more interested in geography and mathematics. They were eager to attend lessons than before.
- Students started practicing peer teaching
- They became self driven regarding revision and searching for information (discovering on their on)
- They became independent and could study with minimal assistance from the teacher
- Students were studying without coping notes – they could download the required material on diskettes
- Increased students concentration during lesson
- Students read ahead of what had been covered in class.

All the students interviewed indicated that their academic performance improved as a result of using ICT based materials. Students found computer-based revision interesting and motivating and therefore easy for them understand and remember what was taught in class. In addition, the students stated that using computer boosted their interest in mathematics and geography hence performed well in examinations.

3.5.3 Effect on students' performance

The evaluation among other things sought to establish the different ways in which the project had influenced the performance of students in the piloted subjects. To establish the overall influence of the programme on students' performance proved a little difficult for three major reasons. The fact that the materials only focused on selected topics and not the entire syllabus of the piloted subjects made it difficult to determine whether the observed improvement was always due to the use of ICT-based curricula.

Second, because there were no follow up materials from one level to another (e.g. once students were taught using ICT based materials in senior one or two, no similar materials were available for them in senior three and four). This coupled with the stated difficulties in accessing computer laboratory facilities for non project classes (see sections 3.3.1 and 3.3.3) made it difficult for one to see a direct relationship for example between what was learnt in senior one or two and a students' 'O' level results.

At another level, whereas teachers were supposed to use the monitoring tool to map out learning outcomes directly associated with the project, only a few teachers took it seriously. In most cases teachers never filled these assessment forms, and according to one core project staff only remembered to fill the assessment forms on seeing the supervisors from NCDC.

The above factors notwithstanding, evidence from Ntare school and Nabisunsa Girls where the teachers took a particular interest in comparing the performance of S.1 students of who were taught mathematics using ICT-based materials and those who were not showed that in both cases the streams taught using ICT-based materials performed better than their counterparts in the end of year exams. The teachers in other schools also acknowledged improvement in students' academic performance but it was not possible to get concrete evidence to that effect.

3.6 Challenges to the use of ICTs in teaching and learning in the pilot schools

The evaluation sought to identify and examine the challenges facing the integration of ICTs in curriculum delivery. Respondents raised a number of factors limiting the anticipated use of ICTs in learning and teaching some of which we have tried to quantify as outlined in figures 4 and 5 below.

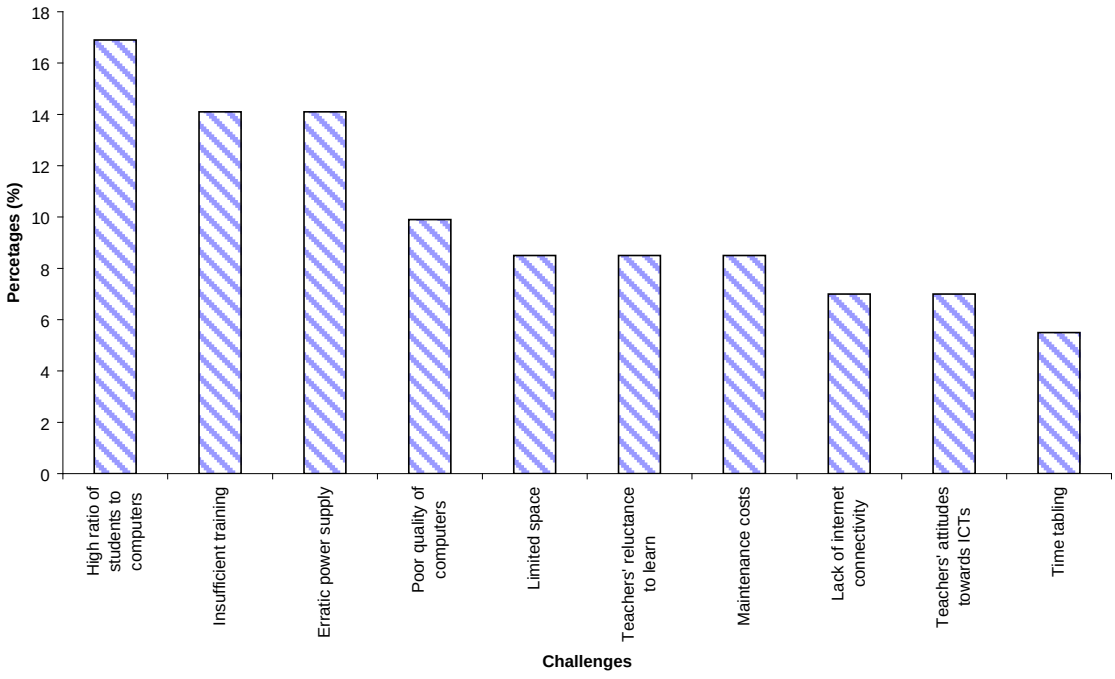

Fig 5Major challenges to the use of ICTs in teaching given by the teachers/administrators

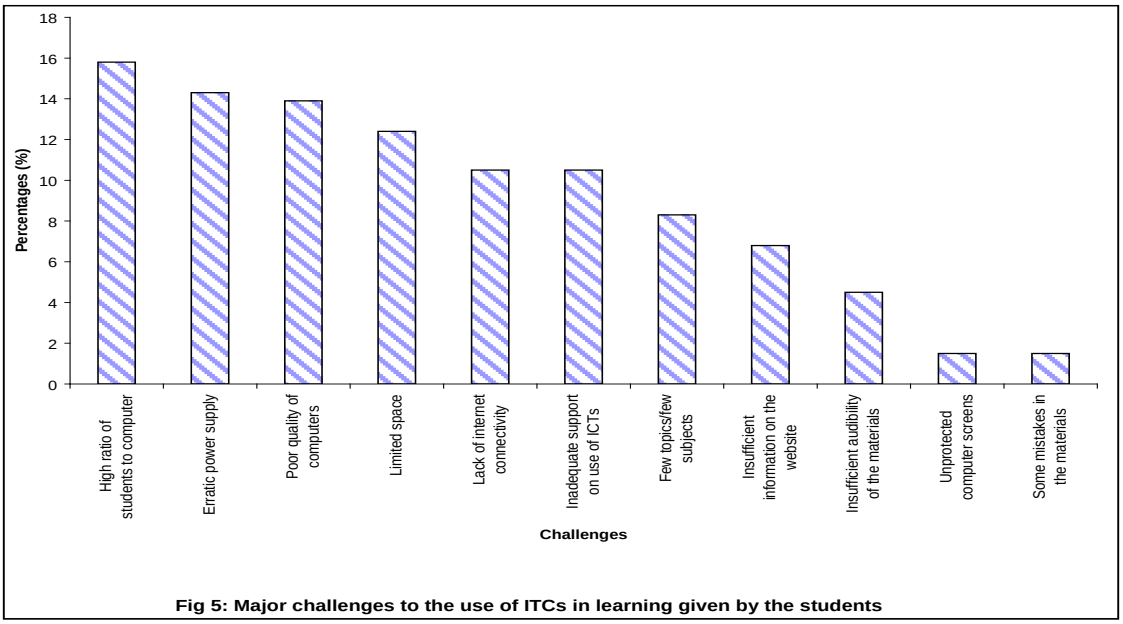

Fig 5: Major challenges to the use of ITCs in learning given by the students

The ratio of students to computers was overwhelming. In some cases like in Bukoyo secondary school, the ratio of students to one computer was as high as twenty students to one computer (20:1). This was aggravated by the fact that in some of the schools the computers were not networked as earlier mentioned (see section 3.5). In such cases, the students crowded around the one computer used by the teacher to teach. In Buckley, Kisowera, Buganda Road and Bukoyo not all computers were networked hence the high ratios of students to computers. .

Whilst it is true that teachers had been trained the same teachers felt that they needed more training to master the ICT skills beyond those required to operate the CurriculumNet programmes. This was confirmed by students' complaint about inadequate support on use of ICTs. The biggest gap in the area of training lay particularly with teachers who joined the project late or those who attend only part of the entire training cycle.

According to the teachers and administrators interviewed from the different schools the numbers of teachers trained in the use of ICTs was very small compared to those not trained. The untrained teachers were said not only to lack the basic knowledge of computer use but also their attitudes were apathetic and at times bordering on outright

negative. They felt more comfortable to continue teaching using the traditional chalk and talk method which they were used to and could confidently use. Such people did not see the value using ICTs.

Core project staff on their part raised a number of challenges including:

- adjustment to the use of ICTs in teaching approaches
- maintenance of computers;
- lack of school policy regarding maintenance of computers
- transfer of trained teachers and administrators
- understaffing of the project
- Lack of equipment has limited the speed at which staff and students were supposed to acquire the necessary competence in use of ICTs.
- Lack/unreliability of infrastructure like electricity
- Resistance from some teachers

a) Adjustment to the use of ICTs in teaching and learning

Core project staff observed that attitudinal change on part of the teachers remained one of the major challenges facing the integration of ICTs in the teaching and learning process in the pilot schools. As one of the project staff observed, "…adopting new methodologies is a big challenge to all teachers, it takes a long time, requires extra preparation, in form of reading and search for materials but many teachers do not seem to have such time and patience, particularly because they are teaching for examinations. Without close monitoring and supervision they readily fall back to their old ways of doing things…"

The introduction of ICTs in teaching and learning constitutes a major shift from what the teachers have long known and were trained to do, to a challenging new approach needing a deliberate and in-depth form of re-orientation both in the practical and philosophical domain to equip teachers with practical skills and the necessary philosophical tools and orientation for a new mindset.

A few teachers reportedly saw the introduction of ICTs as a long term ploy to render them irrelevant. This was coupled with the attitude of some conservative head teachers whose assessment of the teachers' work was the presence of handwritten notes delivered to children in a traditional class environment.

b) Maintenance of computers

The maintenance of available computers was a major problem in almost all the schools visited as table 4 below indicates. Poor maintenance ranged from absence simple servicing of key boards and dusting to the fixing of minor and major mechanical faults. In some of the schools there were more faulty and obsolete computers than functional ones. The fact that in trained teachers doubled as ICT managers aggravated the problem as these teachers did not always have sufficient time to take on all the duties.

Table 4: The state of computers in the different schools

School	**Working computers**	**Faulty computers**	**Obsolete computers**	**Total**
Bukoyo SS	10	7	8	25
Nabisunsa	40	0	15	55
Ntare	15	0	0	15
Buddo	20	0	0	20
Buganda Road	9	4	0	13
Kisowera PS	7	0	0	7
Buckley High	5	0	6	11

c) Lack of school policy regarding maintenance of computers

While it was true that schools were enthusiastic to expand the computer facilities and even appointed some people to manage the facilities, maintaining computers was still a major challenge. Whereas the need to purchase computers seemed obvious, there were

often no obvious maintenance plans, making any breakdowns to constitute a crisis in the system.

d) Transfer of trained teachers and administrators

Transfer of teachers trained under the project and supportive head teachers undermined the project. Trained teachers were transferred to schools which were not part of the project and vice versa. Likewise supportive head teachers were transferred and replaced with those who were not part of the original programme and often with neither sufficient knowledge of the project nor the interest to prioritise the integration of ICTs in educational delivery. This was reported as a major obstacle that was encountered in the implementation of the project.

e) Understaffing of the project

Core project staff felt that they were too few especially after the departure of the Instructional Designer which left the project with one fulltime staff to undertake the day to day running of the project including the centre at the NCDC. The thin staffing created a big challenge especially when it came to the anticipated continuous monitoring of the project to map out the concrete project outcomes as later discussions will show.

f) Lack of equipment and the unreliability of the infrastructure like electricity

The failure to acquire sufficient numbers of computers in the schools limited the rate at which staff and students acquired and utilised the necessary skills. This was coupled with the unreliability and in some places total absence of basic infrastructure like electricity. Alternative sources of electricity like solar which one of the schools opted for were not any cheaper for the resource restricted schools which many of the rural schools are.

3.7 Networks and partnerships evolving from the project

The evaluation sought to answer the question as to what partnerships and networks had evolved from the project and the value of such networks. It was anticipated that the project would lead to the establishment of electronic networks between different

stakeholders, including schools, government departments, local and international actors in the field of education and the private sector, teachers in different schools and students . Evaluation results demonstrated that some important networks were established between CurriculumNet project and a number of local and international partners for mutual support.

At the local level, CurriculumNet exchanged ideas and mutual support with the Connect Ed at Kyambogo University and SchoolNet Uganda, which is affiliated to the Ministry of education. Other local partners include Makerere University Telemedicine project, the Uganda National council for science and technology, Uganda National Examinations Board and UNESCO.

The different partners played different roles in the life of the project; representatives from Schoolnet and Connect Ed for example participated in most of the project activities at different levels. Representatives for the two mentioned that their organisations contributed ideas as early as the project formulation stages, attended all project related functions and on several occasions played an advisory role to the project personnel on a number of issues. Other partnerships were often based on sharing experiences whereby they came to CurriculumNet's to gain from the project's experiences in their areas of strength like content development.

International partnerships were also established between CurriculumNet and a number of organisations. Key international partners included OLIN from Canada which trained and offered technical support on professional development and online curriculum development to project staff. Others were Microsoft, Computers for schools Kenya and Digital links UK. Microsoft were impressed by CurriculumNet activities and agreed to fund the development of the Biology online curricula. Computer for schools - Kenya engaged NCDC to train their personnel in the development of online curricula.

What should be noted here is that despite the evidence of meaningful networking at organisational level, there was no evidence of such networks and partnerships at school

levels i.e. between schools, teachers and students. Each school acted independently although some teachers from different schools at times interacted either as individuals or when mobilised by NCDC. Only a few students mentioned of any form networking with their colleagues in project schools, and there was no evidence of any efforts to initiate such networks between students in project schools. The absence of such initiatives can be seen as a major setback to the achievement of key project goal of networking and partnership building to enhance the use of ICTs in teaching and learning.

3.8 CurriculumNet as an Action Research Project

One of the goals of this evaluation was to assess CurriculumNet as an Action Research Project stipulated in the project document. Action Research is distinguished from other forms of research by three key features namely: investigation, education/learning and action. It is practitioner-based in which direct actors in a given activity research on their own practices to improve their understanding of their work and the ability to act better. In essence it not only aims at continuous professional development but also product refinement based on the knowledge generated during the implementation process. The major underlying assumption of Action Research is that all actors undergo a process of psycho-socio and intellectual transformation and get empowered as professionals. In the case of CurriculumNet, the teachers, the project staff, curriculum specialists, and students constituted the key actors in the project.

One of the strategies for ensuring successful implementation of Action Research is to provide opportunities to the different actors to play their rightful roles alongside critical evaluation of their actions, and conditions surrounding those actions. In the case of CurriculumNet, this was to be ensured through a system of ongoing monitoring in which different actors would continuously inform the project implementers of the different positive and negative experiences and lessons being learnt. This worked to some extent and as result some of the educational materials were reviewed up to as many as four times, based on information provided by teachers and at times students using the materials. According to some teachers and core project staff, students actively

contributed to the improvement of the quality of the materials when they demanded more illustrations in geography, improvement of images, adding animated and motion graphics and improving some of the mathematics examples.

NCDC as an institution was also able to engage in a continuous process of investigating their own actions, identifying their areas of strength and weakness and addressing them accordingly. Apart from learning new skills in developing ICT-based curricula, the project revolutionalised NCDC's method of work by enabling them not only to shift from the traditional approach to curriculum development, to a new ICT-based form of curriculum development, but also to create a new mindset of believing in possibilities.

Action Research as a process characterised by continuous investigation, was largely realised in the CurriculumNet project at the pre-design, design and implementation levels of the project. The learning/educational aspect of Action Research also prevailed in all project processes. The action component on the other hand was not realised at all levels and among all actors. The core project staff, curriculum specialists and a few teachers in the selected schools did most of the practical activities like the development of materials, leaving out some teachers and students. .

One other assumption of action research not realised in this project was the one regarding empowerment of the different actors. Three years into the implementation of the project one would have expected the teachers to have mastered the ICT-based curriculum development skills and moved to a level where they could develop their own ICT-based materials to use locally in their schools. Apart from one teacher who taught using PowerPoint presentations, there was no evidence of any other teacher using personally developed materials to teach using ICTs.

On going Monitoring and Evaluation, an integral part of the action research component of the project was also reported to have been inadequate. The teachers were for example requested to give their experiences of using the materials after 1½-school terms. To some teachers, feedback should have been demanded immediately and more frequently.

Interestingly, this concern by teachers, genuine as it sounds, contradicted their actions in the actual implementation. The majority of teachers failed or refused to use the monitoring tool developed by the project and as such frustrated project efforts.

All in all, the integration of research into teachers' and students' daily approach to learning and teaching based on the principles of Action research not only as a monitoring and evaluation tool but also as learning strategy for learner and educator empowerment was it itself a critical way towards sustaining the use of ICTs in the education system.

4.0 ENSURING SUSTAINABLE USE OF ICTS IN EDUCATIONAL DELIVERY

The evaluation also sought to establish the views of different stakeholders on how to ensure the sustainability of the project goals beyond the project itself. Teachers and administrators saw the following as essential strategies for sustaining the use of ICTs in educational delivery. The views are presented in figure seven below.

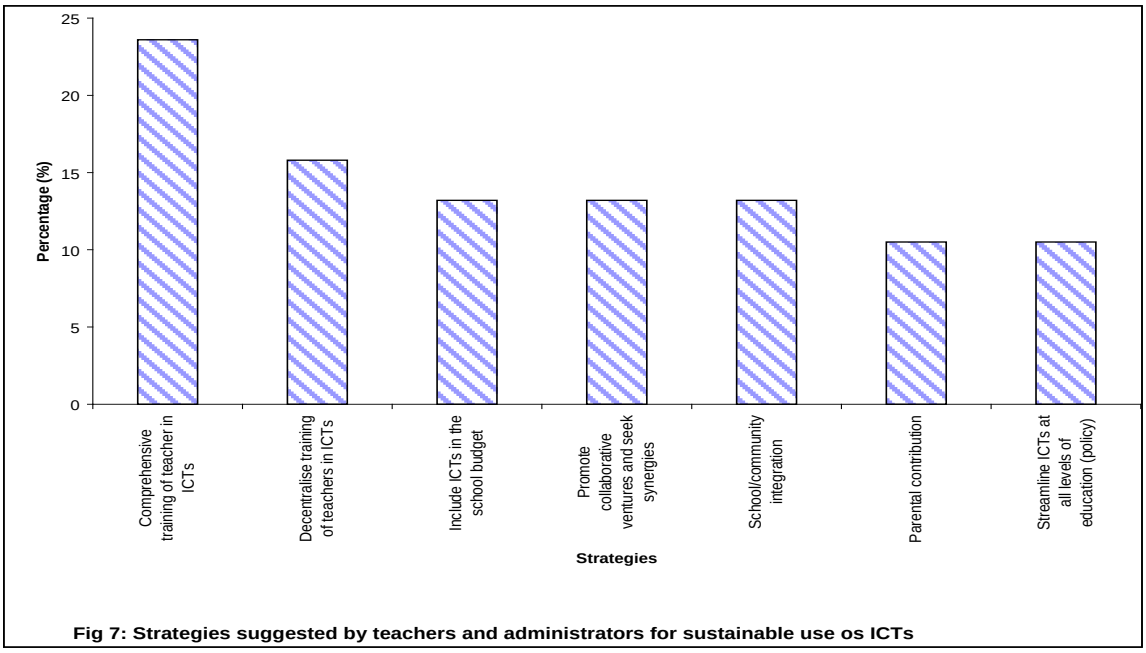

Fig 7: Strategies suggested by teachers and administrators for sustainable use os ICTs

Students' views on how to sustain the use of ICTs in educational delivery are presented in table 5 below in descending order. They argued for example that streamlining ICTs at all levels of education would bring it into the limelight to receive the rightful attention and support like science education, education for girls and the disabled.

Table 5: Strategies for maintaining the use of ICTs in educational delivery as viewed by students

Strategy	Frequency
Streamline ICTs in education at all levels	33
Directly involve government (budget)	25
Appoint fulltime staff in charge of ICTs	22
Integrate an ICT fee in the school fees structure	17
Enlist financial contributions from parents outside fees	15
Orient students in use of ICTs from primary	14
Roll out and in depth (shallow things discourage)	10

We categorised teachers' and students' strategies (figure 7 and table 5) for sustaining the use of ICTs in educational delivery into three broad themes namely: training, technology, policy and school management/organisation.

4.1 Training

As earlier mentioned, teachers and school administrators felt that although many of them had been trained in the use of ICTs in educational delivery, the training had to go beyond project teachers because the entire teacher community at the school is directly responsible to the students' education. Hence the need for comprehensive training in use of ICTs in educational delivery for the entire school community rather than the few individuals involved in the project activities.

Second, it was the view of key respondents including some teachers, school administrators and project staff that the attitude of many teachers towards the use of ICTs in teaching was still negative. The technology phobia and apathy was for example still pronounced among teachers and some school administrators. This could only be addressed through a deliberate system of reorientation backed by policy at school, district and national levels. While for example teachers' access to computers was not as an acute a problem as it was for students, in most schools only a few teachers outside the project showed interest and took advantage the available technology.

Whereas the teachers trained through CurriculumNet had successfully overcome the attitudinal problems, many of them teachers still felt they needed more training. There was need for frequent refresher training not only to consolidate the skills and keep abreast with the developments in the use of ICTs in educational delivery, but also to equip teachers with more technical skills like simple trouble-shooting to avoid unnecessary technical hiccups.

4.2 Technology and the technical feasibility of the project

The quality and quantity of computers in use by different schools has to be addressed if sustainability was to be ensured. Although project staff believed the computers provided under the project met the required standards to perform the expected tasks, respondents across the board felt otherwise. Many of the computers were very slow; others could not use CD-ROMs as they were either faulty or not there at all. Some of the computers in the schools were completely dysfunctional (see table No 4). The majority of computers were weaker models which could not cope with the gravity of the work at hand. Inferior models like 286, 386, 486 and Pentium 1 formed the bulk of computers in schools with a sprinkling of Pentium II and IIIs in better resourced schools like Buddo, Nabisunsa, and Ntare School. In Buganda Road Primary school for example, twelve (12) out of the functioning thirteen (13) computers were Pentium 1 and below, in Buckley and Bukoyo all functioning computers fell in the same category.

These problems were aggravated by the limited numbers of computers available for use in the schools. In some of the schools, Ntare, Bukoyo, Buckley, Buganda Road and Kisowera for example, not all computers were not networked. Teachers instead carried one computer to use in class. Often in such cases students crowded around the same computer.

Effective use of ICTs in educational delivery requires not only strong computers but also reliable Internet connectivity and power supply. Respondents felt that future sustainability of ICTs in education requires a technically sound system to handle the heavy load of online and offline educational materials. The technology as it stood in all

schools was not up to the task. The schools need to under take deliberate steps to upgrade their systems with a view that the systems are essential components of the learning and teaching facilities in the schools, just as the library, the class rooms and the science laboratories.

4.3 CurriculumNet and ICT policy in education

The evaluation aimed to establish the nature of influence the project had had on the national ICT policy in Education. According to key informants in the Ministry of Education, ConnectEd and SchoolNet Uganda, it was not easy to state what influence any programme had single-handedly had on the policy initiatives regarding ICTs in educational delivery. This is because ICT is one a topical issues in the country which has had a number of initiatives from different dimensions. According to one official from the ministry of Education, whereas there is a national ICT policy, the process for formulating a policy on ICT in Education has been initiated.

In the absence of a concrete policy, the ministry has also issued policy guidelines to all head teachers in the country to incorporate ICTs in the schools' annual budgets and plans and integrate ICTs in their core programmes (Nsumba Lyazi – Assistant Commissioner Secondary Education - personal communication). Other initiatives like SchoolNet and ConnectEd which are already in place have also played a key role in informing the policy formulation process. Experiences from these projects have for example partly influenced a new pilot venture to establish Tele-centres in five rural districts. In this venture to be implemented by the Uganda Communications Commission, tele-centres will be set up at schools to serve the schools and neighbouring communities (Nsumba Lyazi - Assistant Commissioner Secondary Education - personal communication).

Respondents felt that much as it was not possible to state the exclusive direct contribution of the project to policy, it had provided information and experiences to policy makers in the ministry of education. It was for instance certain for the ministry of Education that ICT-based curriculum is not only possible but also adds value to the teaching and

learning process in the country. The frequency of consultations by ministry officials also indicated an interest in the project and its potential value.

Respondents felt that one of the ways sustaining the use of ICTs in curriculum delivery was to quicken the policy formulation process. It was not only enough to press for any policy, but a policy that would emphasise nothing less than mainstreaming ICTs in the entire education system in essence, integrating the use of ICTs in the entire primary and secondary school curriculum delivery. This would imply that central, local governments and schools will budget for ICTs in the same way they budget for other educational requirements like books, science equipment, laboratories, classrooms and desks in the schools.

5.0 LESSONS TO BE LEARNT FROM THE PROJECT

The evaluation generated a number of important lessons that can be of value to the future integration of ICTs in curriculum delivery in Uganda's education system. There were several lessons but the five most important ones were related to:

- bridging the gap between the rural and urban schools,
- coping with large numbers and
- managing educational costs
- appropriateness of technology
- expenses

a) Bridging the gap

The evaluation results confirmed the fact that ICTs can go a long way in bridging the quality gap between rural and urban schools. The use of centrally developed educational materials which are not only visual but also audio, animated and in full colour provides an opportunity to students in different parts of the country to access the same kind of materials developed by experts. Students from the different project schools rural, peri-urban and urban expressed the same level of satisfaction and interest in the materials. It was often commented for example that the ICT-based materials were much easier to understand, revise and master than the usual notes given by their teachers. One of the students commented "there is an extent to which you can go in asking a teacher to explain, but with these materials you can revisit on your own as many times as you want".

The above notwithstanding, evidence from project schools demonstrated that successful utilisation of ICTs in bridging the rural-urban gap will largely depend on the availability of basic requirements like functioning multimedia computers of at least Pentium II model, reliable power supply and internet connection. The current state of affairs is far below the minimum. As already observed, most schools lacked the sufficient amounts of

the recommended computers; the power supply is erratic and extremely unreliable. Likewise, schools not only lacked reliable Internet services but also up-to-date networked computer laboratories.

b) Coping with large numbers

The evaluation also demonstrated that it is possible to use of ICTs to cope with large numbers of students but this will also rely on the capacity of the schools to acquire the right technology in the sufficient amounts. Coping with large numbers for example requires more than computers. The schools must also acquire LCD projectors with multiple monitors to ensure that the same material can be relayed to students in separate rooms at the same time. Experiences from Buddo and Nabisunsa where teachers effectively used the LCD projectors to teach students in different rooms testify to this possibility. Unfortunately, the current status of ICTs in the schools including those in the project does not meet some of these basic requirements, implying that any idea in this direction must be cushioned with sufficient funding to avail the necessary ICT equipment and materials.

c) Managing educational costs

Whereas we did not conduct a proper cost-benefit analysis for ICTs in educational delivery, experiences from the evaluation revealed that much as ICTs may look expensive compared to ordinary text books at the initial stage of investment, with time it may become cheaper and more sustainable. Respondents gave an example of using CD-ROMs where by a single CD can contain huge amounts of educational materials and can conveniently be used by large numbers of students. ICT-based materials can be continuously updated unlike the textbooks which not only wear and tear but also become outdated requiring total replacement. The continued need to replenish libraries with entirely new books would in the end become more costly not only in terms of purchasing new books but also in disposing of the old ones.

d) Appropriateness of technology and personnel

According the core project staff, there was a big misconception that producing ICT-based content, only required computers, but such a venture can only be efficiently undertaken with a fully equipped multimedia studio and the appropriate software. Computers alone are rendered useless without the software and the rest of the requirements.

There was also a common problem of looking at ICTs in educational delivery only in terms of computers and their Internet connectivity, ignoring other forms of ICT media like radio and TV which could also play a vital role in improving the quality of learning and teaching in schools.

Besides the technology, there should be adequate key personnel including an instructional designer qualified both in ICT and pedagogy to determine the appropriate design methodologies. An audio Visual multimedia specialist is also necessary to do the video and audio mainstreaming. At school level, a school – based network administrator is essential to test the reliability of the systems.

e) Expenses

The evaluation also exposed the fact that government policy on ICTs which includes a tax waiver on most ICT equipment including computers, does not go far enough to alleviate the cost ICTs. Whilst computers and related items are imported tax-free, Internet connectivity, electricity and maintenance remain costly which indirectly keep the use of ICTs in educational delivery beyond the capacity of many would-be users.

5.1 'Value added' by ICTs

The evaluation sought to document the evidence of any value added by ICTs in the process of learning and teaching the selected subjects. Some of the contributions of ICTs to the teaching and learning process have been discussed in sections 3.3, 3.3.1, 3.3.2 and 3.3.3.

Overall several areas of added value can be mentioned here:

a) Quality educational materials have been developed and subjected to a continuous review process for improvement,
b) The fully multimedia learning materials animated and in full colour both on CD and website have constituted a revolution both in learning and teaching. For once the same materials, in the same format and the same quality can be accessed by students regardless of where they are as long as they have functional computers with CD-ROMs or Internet connections. In short, using the same learning materials across the country creates a sense of equity in curriculum delivery,

c) For the first time a participatory approach to the development of educational materials was used. Curriculum specialists worked hand in hand with teachers as practitioners, to produce teaching materials to be used by teachers in a teaching and learning situation. They did not only produce materials, but were also able to use and review them based on their own findings generated in the process of using the materials,
d) The project has helped both teachers and curriculum specialists to develop skills to conduct research on their own work which is a major component of continuous professional development.
e) For once students have had an opportunity to provide a feedback on how they are taught and their concerns have been incorporated during the revision of the materials,
f) The materials adequately cater for the three learning domains: the cognitive the affective and the psychomotor domains.
g) The use of ICT in itself has constituted a revolution in the way schools think about priorities. In all pilot schools, it was obvious that ICTs were taking a front position among priorities.

6.0 CONCLUDING REMARKS

The evaluation revealed that it is possible to use ICTs in curriculum delivery both at the primary and secondary levels of education provided that all the essential equipment, infrastructure and materials are available. The need to use ICTs in curriculum delivery is real and efforts should be made to address it sooner than later. While the initial costs may appear high, the truth is that they will never be any lower; it is a fact that has to be confronted. It must however be emphasised that ICTs are not meant to displace teachers but to assist them do their job more effectively and efficiently.

To ensure meaningful integration of ICTs in curriculum delivery more comprehensive training should be organised for all stakeholders but more so the teachers. The training should not limit itself to the use of ICTs in curriculum delivery but also some basic maintenance skills like troubleshooting. The duration of the training should also be adequate to avoid situations where teachers are made to rush through important learning experiences.

From a methodological point of view, it is of utmost importance to integrate Action Research in teachers' pedagogical strategies as it helps to transform and empower both teachers and learners intellectually, practically and philosophically.

Appendices

FINAL EVALUATION OF CURRICULUMNET PROJECT OF THE NATIONAL CURRICULUM DEVELOPMENT CENTRE

Questionnaire for Head teachers, Director of studies and Teachers

Dear Sir/Madam,

As you are aware, The National curriculum Development Centre has spent the last three years implementing the CurriculumNet project with the purpose of enabling students, teachers and educational administrators to develop appropriate competencies to use ICTs effectively in the teaching and learning process. You have been privileged to play a pivotal role as the direct implementers of the project. In trying to evaluate this endeavour, we have felt it critical that you provide your independent assessment of the project by responding to the questions below. **Please Use a tick where appropriate.**

SECTION A: Personal Information

(i) Name of the school: ----------

(ii) Position/Post (Head teacher, Director of Studies or Teacher) ----------

(iii) Students numbers Male ---------- Female ----------

(iv) What are the subjects /class you currently teach

SECTION B: ICT TRAINING AND COMPETENCIES IN THE USE OF ICT

1. What training did you get to enable you use ICT in teaching? (and by whom)

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2. How were you trained?

3. Would you regard this training adequate? Why?

4. How have you utilized the training?

5) How computer literate are you? Choose one answer.

(i) Not computer literate at all
(ii) Fairly computer literate- can switch on a computer and run some programs like word processor
(iii) Fully computer literate

6) If you're fully computer literate, indicate what you can do with a computer (you can choose more than one)

(i) Run several programs
(ii) Work with files
(iii) Search for information
(iv) Prepare lessons
(v) Use the computer in teaching

7) How often do you use a computer? Select one.

(iv) Daily
(v) Once a week
(vi) More than once a week
(vii) About once a month
(viii) About once a school term

8) In the table below please indicate the 4 most important ways in which you use the computer at your school. Rank using scale of 1,2,3,4 i.e. 1-most important and 4- -least important.

Use	Rank
Lesson preparation	
Searching information for preparing teaching materials	
Preparation of test and exams	
Preparation of class records, reports e.t.c.	
Administrative work	
Personal use (e.g. email, entertainment)	
Communication with other people on educational issues	
Teaching the topics that were developed by the curriculumnet project	
Other (please specify)	

9) Do you feel sufficiently confident in using the computer in the day-to-day school activities you're engaged in? YES ---------- NO ----------

If YES, indicate at what level of confidence you are? Use a tick.

(ix) Very confident
(x) Average
(xi) Not so confident
(xii) Other (specify)----------

SECTION C: Quality of instruction materials developed

10) What can you say about the quality of the instructional materials developed in terms of:

- clarity

- usability by students on their own

- motivating the learners to learn through personal discovery

- helping students to develop a positive attitude towards the subject

i. To what extent do the materials address the psycho-social and intellectual needs of the learners? (knowledge, skills and attitudes)

(i) Suitability for a particular level

(ii) User friendliness

(iii) Ability to cater for different learning needs of learners (the cognitive, affective and psycho-motor skills, psycho-socio)

(iv) Ability to create positive attitudes toward learning

(v) What role did you play in the development of these materials?

(vi) In which ways have the materials been useful to you?

(vii) Suggest ways of improving the materials

SECTION D: EXTENT OF IMPROVEMENT IN THE TEACHING AND LEARNING PROCESS

11) Do you think CurriculumNet has changed the character of teaching and learning in your school? YES ---------- NO ----------

Please explain ----------

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12) In which ways if any has CurriculumNet enabled you to use ICT in the day-to-day school activities?

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13) How have you utilized online interaction and research to enhance the teaching and learning in your school?

(xiii) Online interaction

(xiv) Research

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14) Do you ever use ICTs in teaching? (Yes/No)

15) If yes how do you feel about using it?

If no what are the obstacles are preventing you from using it?

What is the attitude of other teachers towards the use of ICTs in teaching

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16) Have you assisted your colleagues, students or other people in using the computer as an educational tool? YES ---------- NO ----------

If YES, who have you assisted?

In which ways can you support other people to use ICT----------
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17) Do you feel sufficiently equipped to expand and manage project activities in your school sustain ably?

18) What challenges do you face in using ICT for educational delivery in your schools?

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19) What has the school done to ensure the sustainability of the project? (school policies, guidelines, plans etc)

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20) Suggest ways in which CurriculumNet activities could be improved to enhance the teaching and learning process.

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21) Based on your experiences with the CurriculumNet Project, suggest recommendations for policy formulation on the use of ICT in education delivery.

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22) How much money does the school invest in the use of ICT for teaching and learning each year/?

23) What recurrent costs does the school incur on a monthly basis for using ICT in teaching and learning?

24) How does the school meet these costs?

25) What other strategies does the school have to continue sustaining the use of ICT in teaching financially?

FINAL EVALUATION OF CURRICULUMNET PROJECT OF THE NATIONAL CURRICULUM DEVELOPMENT CENTRE

Questionnaire for Head teachers, Director of studies and Teachers

Dear Sir/Madam,

As you are aware, The National curriculum Development Centre has spent the last three years implementing the CurriculumNet project with the purpose of enabling students, teachers and educational administrators to develop appropriate competencies to use ICTs effectively in the teaching and learning process. You have been privileged to play a pivotal role as the direct implementers of the project. In trying to evaluate this endeavour, we have felt it critical that you provide your independent assessment of the project by responding to the questions below. **Please Use a tick where appropriate.**

SECTION A: Personal Information

(v) Name of the school: ----------

(vi) Position/Post (Head teacher, Director of Studies or Teacher) ----------

(vii) Students numbers Male ---------- Female ----------

(viii) What are the subjects /class you currently teach

SECTION B: ICT TRAINING AND COMPETENCIES IN THE USE OF ICT

5. What training did you get to enable you use ICT in teaching? (and by whom)

---

6. How were you trained?

7. Would you regard this training adequate? Why?

8. How have you utilized the training?

5) How computer literate are you? Choose one answer.

(xv) Not computer literate at all
(xvi) Fairly computer literate- can switch on a computer and run some programs like word processor
(xvii) Fully computer literate

6) If you're fully computer literate, indicate what you can do with a computer (you can choose more than one)

(vi) Run several programs
(vii) Work with files
(viii) Search for information
(ix) Prepare lessons
(x) Use the computer in teaching

7) How often do you use a computer? Select one.

(xviii) Daily
(xix) Once a week
(xx) More than once a week
(xxi) About once a month
(xxii) About once a school term

8) In the table below please indicate the 4 most important ways in which you use the computer at your school. Rank using scale of 1,2,3,4 i.e. 1-most important and 4- -least important.

Use	Rank
Lesson preparation	
Searching information for preparing teaching materials	
Preparation of test and exams	
Preparation of class records, reports e.t.c.	
Administrative work	
Personal use (e.g. email, entertainment)	
Communication with other people on educational issues	
Teaching the topics that were developed by the curriculumnet project	
Other (pleases specify	

9) Do you feel sufficiently confident in using the computer in the day-to-day school activities you're engaged in? YES ---------- NO ----------

If YES, indicate at what level of confidence you are? Use a tick.

(xxiii) Very confident
(xxiv) Average
(xxv) Not so confident
(xxvi) Other (specify)----------

SECTION C: Quality of instruction materials developed

10) What can you say about the quality of the instructional materials developed in terms of:

- clarity

- usability by students on their own

- motivating the learners to learn through personal discovery

- helping students to develop a positive attitude towards the subject

ii. To what extent do the materials address the psycho-social and intellectual needs of the learners? (knowledge, skills and attitudes)

(viii) Suitability for a particular level

(ix) User friendliness

(x) Ability to cater for different learning needs of learners (the cognitive, affective and psycho-motor skills, psycho-socio)

(xi) Ability to create positive attitudes toward learning

(xii) What role did you play in the development of these materials?

(xiii) In which ways have the materials been useful to you?

(xiv) Suggest ways of improving the materials

SECTION D: EXTENT OF IMPROVEMENT IN THE TEACHING AND LEARNING PROCESS

11) Do you think CurriculumNet has changed the character of teaching and learning in your school? YES ---------- NO ----------

12) In which ways if any has CurriculumNet enabled you to use ICT in the day-to-day school activities?

13) How have you utilized online interaction and research to enhance the teaching and learning in your school?

(xxvii) Online interaction

(xxviii)Research

14) Do you ever use ICTs in teaching? (Yes/No)

15) If yes how do you feel about using it?

If no what are the obstacles are preventing you from using it?

What is the attitude of other teachers towards the use of ICTs in teaching

16) Have you assisted your colleagues, students or other people in using the computer as an educational tool? YES ---------- NO ----------

If YES, who have you assisted?

In which ways can you support other people to use ICT

17) Do you feel sufficiently equipped to expand and manage project activities in your school sustain ably?

18) What challenges do you face in using ICT for educational delivery in your schools?

19) What has the school done to ensure the sustainability of the project? (school policies, guidelines, plans etc)

20) Suggest ways in which CurriculumNet activities could be improved to enhance the teaching and learning process.

21) Based on your experiences with the CurriculumNet Project, suggest recommendations for policy formulation on the use of ICT in education delivery.

22) How much money does the school invest in the use of ICT for teaching and learning each year/?

23) What recurrent costs does the school incur on a monthly basis for using ICT in teaching and learning?

24) How does the school meet these costs?

25) What other strategies does the school have to continue sustaining the use of ICT in teaching financially?

Students Interview guide

Dear respondent,
As you are aware, The National curriculum Development Centre has spent the last three years implementing the CurriculumNet project with the purpose of enabling students, teachers and educational administrators to develop appropriate competencies to use ICTs effectively in the teaching and learning process. You have been privileged as one of the direct beneficiaries of this project. In trying to evaluate this endeavour, we have felt it critical that you provide your independent assessment of the project by responding to the questions below.

SECTION A: Personal Information

2. Name of the school: ----------

3. Sex Male ---------- Female ---------- (Use a tick)

4. Class ----------

SECTION B: Competencies in the use of ICT

5. How computer literate are you? Choose one answer.
   (i) Not computer literate at all
   (ii) Fairly computer literate- can switch on a computer and run some programs like word processor
   (iii) Fully computer literate (what does this mean?)

If you're fully computer literate, indicate what you can do with a computer (you can choose more than one)

(xi) Run several programs (name the programmes)
(xii) Work with files
(xiii) Search for information

6. How often do you use a computer at school? Select one by ticking.
   (i) Daily
   (ii) Once a week
   (iii) More than once a week
   (iv) About once a month
   (v) About once a school term

7. In the table below please indicate the 4 most important ways in which you use the computer at your school. Rank using a scale of 1,2,3,4 i.e. 1-most important, and 4-least important.

Use	Rank
Searching information for educational information/notes	
Personal use (e.g. email, entertainment, news, games)	
Communication with other people on educational issues	
Making contacts and searching for opportunities	
Other (please specify	

8. Do you feel sufficiently confident in using the computer in the day-to-day school activities you're engaged in? YES ---------- NO ----------

9. If YES, indicate at what level of confidence you are? Use a tick.
   (i) Very confident
   (ii) Average
   (iii) Not so confident
   (iv) Other (specify)----------

   ----

9) How has the curriculumnet project improved your knowledge and skills in using ICT for educational and non-educational purposes?

10) What particular ICTs skills have you gained as a result of participating in the curriculumnet project?

11) How has your participation in this project changed the way you learn? (Motivation, self drive, independence as a learner, discovering for yourself etc)

12) Has your participation in the project in any way affected your academic performance? How?

13) Have you been able to establish any contacts/links with other students in and outside Uganda as a result of your involvement in the project? (Elaborate)

14) Have you been asked to make any comments/suggestions to improve the quality of ICT – based learning materials?

15) What constraints related to the use of ICT in teaching and learning have you observed during the period of your participation in this project?

17) Suggest ways of addressing such challenges in future?

18) What changes would you like to see in the use of computer based learning in future?

19) Suggest other ways of sustaining the idea of using ICTs in teaching and learning in secondary and primary schools?

FINAL EVALUATION OF CURRICULUMNET PROJECT OF THE NATIONAL CURRICULUM DEVELOPMENT CENTRE

In-depth interview guide for project staff

Introduction: The National curriculum Development Centre has spent the last five years implementing the curriculumnet project with the purpose of enabling students, teachers and educational administrators to develop appropriate competencies to use ICTs effectively in the teaching and learning process. You have been privileged to play a pivotal role as the direct implementers of the project. In trying to evaluate this endeavour, we have felt it critical that you provide your independent assessment of the project by responding to the questions below.

1. Personal Information

i. Position in the project ----------
ii. When did you start working with this project?
iii. Educational level
iv. What is your area of specialisation?
v. What training have you had to enhance your capacity to work on this project?
vi. What specific skills and knowledge have you gained as a result of working on this project?

2. The Resource Centre at NCDC

i. What new ICT equipment have been acquired to upgrade the resource centre during the project period?

ii. What was the resource centre like before the project?

iii. How has the resource centre changed during the project period?

iv. How have the a) staff b) affiliated institutions used the resource centre?

3 Cadre of teachers, administrators and students using ICT for educational purposes

i. How many were trained over the entire project period?
ii. In what specific areas of expertise were they trained?
iii. How many school administrators were trained and in what areas of expertise?
iv. What specific skills/competencies have the teachers and administrators acquired from the project?
v. How have the a) teachers, b) students c) administrators used the ICT skills in teaching and learning processes?
vi. How have the teachers transferred the acquired skills to other non-pilot subjects?

vii. Did any teachers acquire ICT skills and expertise indirectly? How did this happen?

Teaching and learning

i. What evidence is there to prove that teachers are using ICT to enhance teaching? (lesson preparation and content delivery)
ii. What skills and techniques of teaching, preparation and assessment have teachers acquired through the project? Online interactions?
iii. Can you describe the attitudinal changes you have observed in teachers with regard to the use of ICT in teaching and leaning situations? (breaking the ICT phobia, learning to learn – self propelled, dependency on ICT as opposed to the traditional chalk and talk etc?)
iv. What about practical changes?
v. What evidence of change can be traced in students' ways of learning? (motivation, drive to discover, any surprises etc?)
vi. Is there any observable evidence in students performance that can be attributed to the project?

Materials

iii. What teaching and learning materials were developed as part of the project? (actual materials and learning levels)
iv. How were the different materials developed? (process, methodology and persons)
v. How do you rate the quality of theses materials and why? (as compared to other materials you know or have used) – in terms of clarity, usability by individual learners,)
vi. To what extent do the materials address the psycho-social and intellectual needs of the learners? (knowledge, skills and attitudes)
vii. What kind of data bases have established?
viii. How are these accessible to the different users?
ix. Is there a way of tracking the frequency of use of the online materials? (statistical evidence)

Networks and partnerships

i. What links have been established between the project and other organisations/groups/institutions?
ii. What networks have developed between the different institutions and other stakeholders?
iii. What do such networks do? (Focus/areas of interest?)
iv. Of what benefit have these networks and linkages been to the different partners?
v. What role have the partnerships played in the implementation of the project?

vi. Are there any professional linkages that have been developed between teachers in different schools in the country/region/overseas? (cite examples)
vii. Are there any networks/contacts that have been developed between students within and outside the country?
viii. What are the issues addressed by the networks?
ix. Have you established a curriculum network linking all project schools?
x. How is the network operating?

Influence on educational ICT policy

i. What lessons have been learnt from the project to inform the national ICT policy in Education?
ii. Is there a deliberate system for informing educational policy makers about the issues and lessons emerging from the project?
iii. How are Ugandan educational policy makers learning from the project?
iv. How have they utilised the project to inform their policy formulation actions?
v. Has the presence of the project in any way influenced government commitment to funding ICT in education? (Any increase in funding? Any other concrete supportive actions?)
vi. What impact has the project had on the level of funding ICT in education by donor agencies?
vii. What are the other direct and indirect influences of the project on ICT development in the education sector in Uganda?
viii. What policy recommendations do you have for integrating ICTs in educational delivery in Ugandan schools?

ICT and the curriculum development processes

i. What influence has the introduction of ICT had on the curriculum development process?
ii. How has the introduction affected the character of curriculum, educational materials development, sharing and dissemination processes?

Action research in the implementation of the project

i. How far have you integrated research in the project implementation processes?
ii. Describe how you have used the research as a tool for ongoing strengthening of the project? (involvement of teachers and learners as researchers, breaking of the hierarchical relationships in the educational system,)
iii. How have you and other actors benefited from the research component (continuous professional development for teachers?)
iv. What changes were introduced in the project as a result of action research findings?
v. What lessons have been learnt regarding technical feasibility of the project through the research component?
vi. What lessons have been learnt through action research regarding the economic viability of ICTs in educational delivery?

vii. How much institutional learning has taken place as a result of the action research component of the project?
viii. What system has been developed for research, monitoring and evaluation of ICT integration in schools?
ix. How useful have you found this system to be?

Challenges during implementation

i. What practical challenges related to the use of ICTs during the implementation of the project? (access to the technology, numbers of students vs computers, connectivity, power reliability etc)
ii. How have such challenges been addressed?
iii. What challenges have been encountered in trying to make teachers, administrators and students literate in ICT? (psychological /attitudinal challenges e.g. mindsets located in the old thinking)
iv. How have such challenges been addressed?
v. What structural/systemic challenges have you encountered? (revolutionalising the system – changing old structural thinking and ways of doing things)
vi. How have such challenges been addressed?

Strategies for ensuring project sustainability beyond its life cycle

i. Has the project been integrated in the programmes of the different participating institutions?
ii. What alternative sources of funding have been identified and how much are they likely to contribute?
iii. How much capacity has been built at the local level (within institutions/schools, colleges) to carry forward the activities of the project?

Lessons for future implementation

i. What evidence is there to show the viability of ICTs in coping with large numbers?
ii. What evidence is there to show that ICTs can help to bridge the rural-urban gap in education?
iii. How cost effective is the use of ICTs in educational delivery?
iv. Economic viability
v. Given opportunity to replicate this project somewhere else what changes would you suggest in the original project design? Why?

FINAL EVALUATION OF CURRICULUMNET PROJECT OF THE NATIONAL CURRICULUM DEVELOPMENT CENTRE

Interview guide for curriculum specialists

Introduction: The National curriculum Development Centre has spent the last three years implementing the curriculumnet project with the purpose of enabling students, teachers and educational administrators to develop appropriate competencies to use ICTs effectively in the teaching and learning process. You have been privileged to play a pivotal role as curriculum specialist in the project. In trying to evaluate this project, we have felt it critical that you provide your independent assessment of the project by responding to the questions below.

1. Personal Information

vii. Position in the project ----------

viii. When did you start working with this project?

ix. Educational level

x. What is your area of specialisation?

xi. What has been your role in this project?

xii. Did you need to be trained to be able to play your stipulated role in the project?

xiii. What training did you get to enable you work on this project?

xiv. Comment on the adequacy and usefulness of this training?

xv. How have you supported the project? (supported teachers?)

xvi. What specific skills and knowledge have you gained as a result of working on this project?

2. Production of educational materials

x. What teaching and learning materials were developed as part of the project? (actual materials and learning levels)

xi. What role did you play in the development of these materials?

xii. Are you satisfied with the current process of developing these materials? Yes/No

Why?

xiii. How do you rate the quality of theses materials and why? (as compared to other materials you know or have used) – in terms of clarity, usability by individual learners,)

- clarity

- usability by students on their own

- motivating the learners to learn through personal discovery

- helping students to develop a positive attitude towards the subject

xiv. To what extent do the materials address the psycho-social and intellectual needs of the learners? (knowledge, skills and attitudes)

xv. Have you as a lead person taken deliberate steps to get generate feedback form
   a) students,

   b) teachers on these materials

xvi. How have used such feed back?

xvii. What steps have you taken to improve these materials?

3. Learning and teaching

xviii. What changes in ways of learning did you expect this project to create among students?

xix. Which ones of the expected changes have been achieved?

xx. Which ones have not been achieved and why?

xxi. How has the use of ICT in teaching affected the way teachers teach?

xxii. What lessons have you learnt regarding the use of ICT in educational delivery?

xxiii. What do you see as the main obstacles to the use of ICTs in educational delivery in Ugandan schools?

xxiv. Suggest ways of overcoming some of these obstacles

xxv. What policy recommendations do you have regarding the use of ICTs in educational delivery in Uganda?

xxvi. Suggest ways of sustaining this project idea beyond the current project